CONSULTANT
CADD STANDARDS

A. PURPOSE OF STANDARDS

Computer-Aided Drafting and Design (CADD) is an integral part of engineering design process. This document is intended to provide guidance for the DESIGN CONSULTANT. It is envisioned that many different types of CADD systems may be used. The City of San Diego is using Microstation CADD systems for engineering design, mapping, and document production. The terminology of this document follows the customary usage for microstation systems, recognizing that other CADD systems use different terms for similar concepts.

These standards provide instructions to the DESIGN CONSULTANT only on matters directly related to CADD. For legal purposes, the primary deliverable for engineering drawings will be mylar plots with original wet signatures and electronic seals. However, delivery of the corresponding computer files for CADD design and drawings is also required.

These standards are not a CADD instruction manual and are not intended to serve that function. The assumption is made that the DESIGN CONSULTANT has internal procedures for using any selected CADD system and is capable of implementing the City's Standards. To be compatible with the City, all non-Microstation CADD files must be translated into Microstation format. The DESIGN CONSULTANT shall develop standards for any non-Microstation CADD system that permits conversion to Microstation file format, so that the resulting Microstation files conform to the requirements set forth in this document.

It is anticipated that CADD design files created during the planning pre-design, design, and construction of the City's facilities will be used by the City over the lifetime of those facilities. Therefore, these standards have been established to promote uniformity and good practice in the use of CADD systems by the DESIGN CONSULTANT. The objective is to provide the necessary controls to enable the Project Engineer to accept, organize, and quality check the CADD files during the design phase and to enable the City to retrieve and modify the CADD files during operation, maintenance, and modification of the City Facilities.

The scope of these standards, stated in broad terms, is to provide the following quality characteristics in the CADD files generated as part of the City of San Diego:

1. Data separation using level, color, and line weight within each design file or model to organize different types of elements.

2. Engineering discipline separation using separate CADD files or separate CADD models spaces within one CADD Master File to overlay information for inter discipline coordination.

3. Uniformity in major aspects of CADD design such as units of measurement, text, font and size, border and title block.

B. COMPUTER FILES TO BE AVAILABLE TO DESIGN CONSULTANT

The following project-specific files will be provided to the DESIGN CONSULTANT by the PROJECT MANAGER:

    1.   Aerial Survey, Topographical Survey, Survey Coordinate Data and T-file (2-D version), Digital terrain model file or files formatted DTM.

The following standard items are available in both Microstation V7 and V8 formats to the DESIGN CONSULTANT on the internet at
http://www.sandiego.gov/engineering-cip/drawings.shtml

    1.   "Seed Files" (blank files) for 2D and 3D Design Files for Specific Applications (per Sub. Section G).

    2.   "Sheet Files" for standard D-sheet format, including border title block and profile grids in F0setup.dgn and F1setup.dgn (per Sub. Section H).

    3.   Standard color tables (per Sub. Section J) and standard pen tables (per section M).

    4.   Standard fonts (per Sub. Section K).

    5.   Standard cell libraries (per Sub. Section L).

    6.   Standard Pen tables.

    7.   Standard Line styles.

In addition, the following items will be made available to the DESIGN CONSULTANT upon request, when applicable and available:

    1.   Standard Details for the civil, architectural, structural, mechanical, electrical, and instrumentation disciplines.

    2.   Standard level structure for architecture, structural engineering, mechanical engineering, electrical engineering and instrumentation disciplines

C. DELIVERABLES FROM DESIGN CONSULTANT

The following checklist is a summary of the items mentioned throughout the CADD Guidelines that the DESIGN CONSULTANT should deliver to the PROJECT MANAGER at 30%, 75%, 90% and 100%. The applicability of each item in the list will depend on the scope and nature of the CADD work done by the DESIGN CONSULTANT.

1. Mylar plots with original wet signatures and electronic seals at 100%.

2. Microstation-format drawing files (2-D F-files or models) corresponding exactly to each plot.

3. Microstation-format designs file (2-D T-file or models).

4. Plot files, including plotting parameter files.

5. Any additional (non-City provided) fonts, cells and patterns used.

6. If additional parameter files were associated with the use of Microstation application software, including Sewer Modeling Design Files (formatted SDB) using Storm & Sanitary software by Bentley used to generate Existing and Proposed profiles, and Horizontal Alignment Coordinate Listing Files (formatted ALG) for Sewer and Water Replacement Jobs using In-Roads software by Bentley, used to display stationing and Proposed Horizontal Alignment Coordinate reports, then they need to be submitted.

All electronic deliverables shall be provided via compact disc (cd) formatted for Windows operating software (Windows 2000 operating system), and all hard copies need to be submitted in D size sheets, half size sheets might be requested by the Project Manager also.

D. METHODOLOGY FOR CADD DESIGN AND DRAWINGS

The CADD design & Drawings data includes the T file / model that consists of the entire design plane. It is created by combining aerial, survey and right of way data. The T file / model may be created as 2D or 3D (the City of San Diego internally uses 2D). All plan view elements are designed within this file / model, including existing and proposed water and sewer mains, laterals, valves, hydrants, manholes and any other appurtenances. For a detailed breakdown of T file / model elements, see Level Structure Exhibit I-1 and the Guidelines and Procedures included in Section 4 of this manual. It is deliverable at each design stage. The final T file / model shall be transmitted as a 2D file which will be incorporated into the City of San Diego's GIS database.

The D sheets files / models, or F setup, are then created by referencing in the design T files / models, so that the latest design changes will always appear in the drawings. Profiles, text and callouts are created in the F file / model to produce the final engineering drawings. For a detailed breakdown of F files / models elements, see Level Structure Exhibit I-1 and the Standards and Procedures included in Section 4 of this manual. The F files / models are plotted onto mylar and signed to be used for construction. The final F files / models shall be transmitted as a 2D file which will be incorporated into the City of San Diego's engineering database. After completion of construction, the mylar drawings are revised to reflect the "as-built" condition, and are signed and incorporated into the City's Maps and Records system for public record. A sample F files / models and corresponding portion of the T file / model are shown in Exhibits D-1 and D-2.

E. FILE SPECIFICATIONS

In general, the DESIGN CONSULTANT may generate design drawings using any CADD system and any design application software customarily used. However, the deliverable CADD files must be in Microstation ".dgn" format. All engineering drawings are self-contained drawing files.
If other reference files have been used during the course of engineering design, then they need to be merged into the drawing files before the final submittal.

The DESIGN CONSULTANT must translate all drawing files generated with another CADD system into Microstation ".dgn" format. Translated CADD files must meet the same quality requirements as CADD files created on a Microstation system. Any unusual or abnormal characteristics will make a design file unacceptable. The following points are examples (not a complete list) of quality requirements.

1. The working unit resolution must be correct and the elements must be a reasonable scale. Round-off problems can occur when going from less precise decimal-number systems to the Microstation integer-accuracy system

2. Complex elements must be preserved. A file consisting of all line segments is definitely not acceptable. Some typical complex elements are cells, text, line strings, blocks, shapes, circles, ellipses, and arcs.

3. Closed shapes must be closed precisely.

4. Line strings and curve strings must match precisely at each vertex and must be formed as a continuous, complex element.

5. Elements that are filled with color must use the "fill" parameter. The use of multiple elements to create solid area fill is not acceptable.

6. The text font and size requirements must be met, as set forth in Section K of the CADD Guidelines. Text that does not "fit" into shapes, but is obviously too large or too small in the context of the drawing, will not be accepted.

F. FILE NAMING CONVENTION

A standard file naming convention has been established for easy of use and incorporation into the City's database. The file names consist of a 3-letter abbreviation of the company followed by the group job number or abbreviation designation followed by the file type, i.e. AWB506t.dgn The types of files are designated as follows:

> M - Master design file and engineering plan and profile drawings.
> That consists of:
> Survey 3D model (from Survey)
> Aerial 3D model (from Survey)
> Right of Way model (from Survey)

City Forces Sheet model. (Optional if included in F-file)
T model, design plane file
F models, engineering drawing models in standard of 10-sheet per model.
Displays models, Traffic data models, miscellaneous models, etc.
P- Plot files if there are any .

Or separate Microstation files that are designated as follows:

s -	Survey 3D file (from Survey)
a -	Aerial 3D files (from Survey)
c -	City Forces Sheet. (Optional if included in F-file)
t -	T-file, design plane file
f0, f1, f2 -	F-file, engineering drawing files in standard 10-sheet per file format.
x1, x2.... -	Displays, Traffic data, Miscellaneous, etc.

G. SEED FILES

Each of the disciplines listed below will have seed files containing parameter settings that meet the needs of the specific application. Working units and global origin are the most prominent parameters that differ between applications. Many other parameters, such as text, font, will be consistent throughout the project.

The applications with specific seed files are:

1. Aerial surveys, site design, plan; and profile sheets.

2. Mechanical, structural, and electrical design.

3. Architectural design using the Project Architect software.

4. Process and instrumentation schematic drawings produced using the PDS software.

5. General non-scaled drawings and figures.

All files provided to the DESIGN CONSULTANT will contain the applicable seed file information. The seed file parameters are specified as follows and are also listed in Table G.1.

WORKING UNITS (MICROSTATION ONLY)

For civil site design drawings, including aerial surveys, the seed file working units will be 1:10000. Each master unit (MU) is one foot, each sub-unit (SU) is one tenth of a foot, and each positional unit (PU) is one-thousandth of a sub-unit. This results in design file resolution of one-ten thousandth of a foot, and a design plane that is unlimited in size.

For mechanical, structural, and electrical design, the seed file working units will be 1:12:1000.

Each MU is one foot, each SU is one inch, and each PU is one-thousandth of an inch. This provides for dimensioning on construction drawings in the conventional English units of feet and inches.

For architectural design using Project Architect, the seed file working units will be 1:12:8000.

For process and instrumentation schematic drawings produced using PDS, that seed file working units will be 1:254:100.

GLOBAL ORIGIN (MICROSTATION ONLY)

The global origin for general drawings, including mechanical scaled drawings and schematic diagrams, is the center of the Microstation design plane.
For aerial survey model, the City of San Diego Survey Section, Engineering and Capital Projects Department, has established global origin values that make the Microstation design plane capable of mapping the City of San Diego boundary when using Lambert Zone 6 Coordinate values in NAD83. The City has adopted the same global origin values for civil drawings and any design files used in conjunction with site locations. For a Three dimensional file, the global origin values are:

$$\text{NAD83:} \qquad \text{GO} = -6165251.6353, -1772251.6353, 214748.36$$

For a two dimensional file, omit the third value (214748.36). The numbers are shown in the displayed format. If it is necessary to set the global origin of a file, key in the values listed above with the opposite algebraic sign.

H. DRAWING SHEET PARAMETERS

DRAWING SIZE
The standard drawing size for engineering drawings is D size which is defined as 34 x 22 inches.

SHEET FORMAT
A standard 10-sheet model format developed by Water and Sewer Design Division must be used. The model includes the standard seed file information, standard D-sheet layouts including border, title block, cover sheet and profile grids. The file F0setup.dgn is for drawing sheets 1-10, including the cover sheet. Additional files F1setup.dgn and F2setup.dgn are used as necessary for drawing sheets 11-20 and drawing sheets 21-30, respectively. Both F0setup and F1setup formats are shown in Exhibit H-1. Per Section B, these files are available via the internet.

I. LEVEL STRUCTURE

Levels serve to organize information within a single design file, belonging to a specific engineering discipline, in much the same way that reference files serve to organize a project among disciplines. These levels can all be viewed simultaneously or they can be toggles on and off selectively to display required portions and combinations of information.

CIVIL ENGINEERING LEVEL STRUCTURE

The DESIGN CONSULTANT should adhere to the designated content per level shown in the Engineering and Capital Project Dept. Level Structure as shown in Table I.1.

SURVEY LEVEL STRUCTURES

The level structure for survey files shall be consistent with the same level structure as civil engineering as addressed above. For digital terrain models, the level structure shall adhere to the level structure depicted in Table I.2.

OTHER LEVEL STRUCTURES

Level structures for other disciplines, including architecture, structural engineering, mechanical engineering, electrical engineering and instrumentation are also standardized and are available from the PROJECT MANAGER if necessary.

J. GRAPHIC PARAMETERS

A distinctive graphic should be produced for each level by following the assigned color, weight, and line style for each level, also shown in the Engineering and Capital Project Dept. Level Structure, Table I-1.

LINE WEIGHT

Microstation offers 32 different weights to facilitate the clarity and comprehension of the design and enhance the quality of the work performed. Most elements, including text, are affected by weight. Weight is controlled with the command "Active Weight", or "WT=". For technical reasons related to hardware, there is variation among screens and plotters in the thickness produced for each step from line weight 0 (thin) to line weight 31 (wide). The deliverable(s) should produce plots with the line weights equal to the above Microstation standards.
A City line weight standard has been established to produce consistent construction documents that are clearly and accurately understandable. This standard is implemented using special pen table and the Microstation Plotting Software IPLOT. Screen displays are not controlled. Only weights 0 through 15 are defined by the standard, since heavier weights are not normally needed. The proper line weight for D-size plots (22 x 34 inches) are shown on Exhibit J-1. The line weights for half-size plots (11 x 17 inches) are half as thick.

To produce the standard line weights on a D-size plot, use full.tbl pen table, to produce the appropriate line weights for a half-size plot, use half.tbl pen table. Both pen tables are available on the internet, per Section B.

LINE STYLE

The line styles shown on Exhibit J-2 are part of every Microstation system. The command "Active Style", or "LC=" (meaning line code), is used to control this graphics parameter. These may be used as necessary for clarity or specific purposes within the project. Line style and weight in combination produce additional variety. The deliverable(s) should produce plotted drawings with the line styles equal to the above mentioned Microstation standards.
In addition, custom line styles have been developed for frequently-utilized existing and proposed facilities. These custom line styles are shown in Exhibit J-3 and should be used when possible.

COLOR

The Microstation design file format can store color numbers 0 through 255, or 256 different colors. However, the color numbers listed in the CADD Level Structure generally refer to the basic color table with only seven colors, shown on Exhibit J-4. The full color table is available on the internet, per Section B. The deliverable(s) should produce plotted drawings with the colors equal to the above mentioned Microstation standards.

K. LETTERING

The appearance of lettering on a CADD plot depends on the text font, the text parameters (size, spacing, justification), graphics parameters (line weight), and the plotting scale. Only upper-case characters should be used for all lettering.

FONT LIBRARIES

The font library will include, at the minimum, fonts 1, 23, and 50. Application software will require additional fonts. Microstation font 1 will be the basic text for the City. It is a straight (not slanted), proportionally-spaced, non-area fill (stick) font that is delivered with every Microstation system. General drawing annotation should be done using this font. Font 23 will be used for Italicized letters. Font 50 is a straight, monospaced, non-area fill font that will be used for charts and columnar tabulations. The standard fonts are available on the internet, per Section B. In addition, Exhibit K-1 depicts the standard text styles.

The DESIGN CONSULTANT may use other fonts for specific purposes. These fonts may be style chosen from the Microstation selection or may be special ones created by the DESIGN CONSULTANT, such as symbol fonts.

TEXT PARAMETERS

Uniformity in text size as well at style is to be maintained. The minimum text height for D-size plot (22 x 34 inches) will be 0.12 inches. Normally text width will be equal to text height and spacing between lines will be equal to one-half of text height. Plots which are used as half-size

drawings may have text which is half as large, since further reduction of these sheets is unlikely. Larger text sizes may be used as required.

Planning is required to create text which has the proper size after plotting. Since design work is done using actual physical measurements, often called "real world units", but plotters generate output on paper measured in "plotter units", some calculation is needed. In the examples below, notice that scale is multiplied by 0.12 to determine the text size parameter.

The following are examples of parameters for 0.12 inch text after plotting. Design file working units of 1:100:1000 with Master Unit "foot" are assumed.
1. Schematic drawing, plotted at scale 1 inch (plotter unit) equals 1 foot (master design unit), needs TX = 0.12.

2. Scaled drawing, plotted at scale 1 inch (plotter unit) equals 40 feet (master design units), needs TX = 4.80.

3. Scaled drawing, plotted at scale 1 inch (plotter units) equals 200 feet (master design units), needs TX = 24.00

L. CELL LIBRARIES

During the design of a project, the DESIGN CONSULTANT will use many standard symbols (cells) to display information in graphic form. These cells are stored in cell libraries, from which they can be copied and placed into individual design files. The symbol graphics, color, line weight, line code, and text parameters (if any) are fixed when the cell is created and stored in a library.

The DESIGN CONSULTANT should use Water and Sewer Design Division standard cell libraries awbelib.cel for existing facilities and awbplib.cel for proposed facilities where feasible. Per Section B, both standard cell libraries are available on the internet. In addition, these standard cell libraries are printed and indexed in Section 2 of this manual.

Standard cells in design files should maintain their status as a complex element. If additional custom cells are created, the cells should be dropped prior to submittal.

M. PLOTTING

The plotting operation has significant influence on the appearance of the finished product, the engineering drawing.

The DESIGN CONSULTANT should produce D-size sheets for most drawings. The outer edge of the D-size paper is 22 x 34 inches. The size of the plotted border will be somewhat smaller, to provide for margins.

The Project Engineer will furnish a design file containing the City's border. Included in this design file is and extra rectangle, measuring exactly 22 x 34 inches when plotted at 1:1 scale, for use as an aid in accurately scaled plotting. The drawings must be scaled appropriately depending on the planned plotting scale. To initiate plotting, a fence is placed using the rectangle as a guide and the desired plotting scale is entered. The size 22 x 34 inches should be returned by the system, serving as verification. There is an error if any other size is calculated by the system.

The black and white color table, two pen tables for controlling line weight, are available through the internet, per Section B.

The final construction drawings for construction bid must be plotted on four-mil mylar using electrostatic toner.

N. PHOTOGRAMMETRY

The following abbreviated model scope of services statement identifies many technical issues and should be used as a model in obtaining photogrammetry. However, the DESIGN CONSULTANT must adapt the statement to the specific situations. The same graphic standards outlined in this manual must be applied to all survey files unless otherwise noted.

1. Aerial survey consultant shall provide a single three-dimensional (3D) Microstation ".dgn" format containing mapping data in a continuous form (single map). Graphics shall be positioned in the approximate center of the design plane and global origin adjusted to match the California State Plane Coordinate System. Elevations to be based on City of San Diego datum. Each contour must be a continuous element.

2. A separate Break-line/Spot elevation model which contains all planimetric and topographic features as break-lines and spot elevations necessary to create an accurate digital terrain model (DTM) of the aerial mapping area, also in Microstation 3D ".DGN" format. The contours shall be generated from this DTM data. NOTE: this .DGN file will have a unique level structure per attached DTM file level and symbology structure see Table I-2.

   NOTE: Break-line defined - A series of line segments which delineate and define the discontinuities of the terrain (model) surface (improved and or unimproved). Examples of break-lines are edges or roadways (paved or unpaved), crown of street, natural or man made flowlines, drains, changes in slope gradient, edges of graded pads, tops and toes of slopes, tops and bases of retaining walls, steep cliff faces, retaining structures such as bridge abutments, etc.

3. Aerial survey sub-consultant shall supply an ASCII data file containing all XYZ data

points related to ground surface and surface features colleted form photographic models. It is preferred that this file contain feature codes relevant to the point data which identify ridges, breaks and obscure areas for later processing under the Microstation INSITE software.

Coordinate values of X, Y, Z values for regular points shall be provided in a separate ASCII file, to provide for later processing under the Microstation DTM (Digital Terrain Modeling) utilities. The three coordinates for a point should be together on a single line in the file. Each value should be written as a whole number, a decimal, and two decimal places, and should be right-justified within a 13-character space. There should be no leading zeros. These points should be the original points that generated the contours shown on the corresponding design file.

Addendum A
WSD Consultant V8 Help

Disclaimer: Information in this addendum is provided as courtesy from the City of San Diego \ Engineering and Capital Projects \ Water and Sewer Design Division to its consultants. This information is not necessary to cover all encountered problems using V8, nor covers all solutions or fixes.

Scope: Consultants may have problems giving WSD files in V8 format and need guidelines for publishing V7 standards documents in the V8 file format. Since some consultants have upgraded to V8 and they will benefit from a list of issues they might encounter when working with a V8 file format with the City's Pre-V8 standards.

Objective: Provide consultants with high-level procedures to guide the creation of submittals for WSD drawings in the Microstation V8 file format using the City's Pre-V8 standards. We will further discuss the City's lessons learned when using V8 with Pre-V8 standards. The main objective of this document is to assist consultant resolving V8 encountered problem.

Note: Consultants should receive from WSD the cell libraries, color table, seed files, units.def, and font and line style resource files in V8 format.

Starting with a blank file

If a consultant needs to start a project using a blank V8 file (not city seed file), the working units must be set to be compatible with the City's workflow. The following steps will help setup your blank file to meet the City's needs.

Define working units - in a V8 file that are equivalent to those needed by the City when using their Pre-V8 standards files (cells, line styles, etc.)

1. Copy the units.def file to ...\Bentley\Workspace\System\data. Make sure the file is named "units.def" (this file is provided by the City).
2. Open the V8 file you want to make equivalent in Microstation.
3. In the Microstation Key-in command line type the following, exactly: set units "survey feet". If the above command is successful a message in the Message Center window at the bottom of the Microstation window will confirm: Working units: Survey Feet, Survey Feet. If it is not successful then the units.def file is not located in the location described in step #1 above.
4. Go to File > Save Settings. Exit the dgn file.

To further confirm that the settings were preformed correctly:
5. Go to Settings > Design File..., click on Working Units.
6. In the dialog unit names should read as follows:
    >   Master Unit: Custom MU   Label: sf
    >   Sub Unit: Custom MU   Label: SU

7. Click the Custom Units button. In the dialog the Custom Units should read:
    >   Master Unit Definition: 30480061 sf = 1.00000000 meters
    >   Sub Unit Definition: 0.0030480   SU = 1.00000000 centimeters
    >   Note: The same procedure applies for Metric units, however the command is:
    >   set units meters

This should create V8 dgn files with working units that are compatible for use with the City's Pre-V8 standards files (cell libraries, line styles, etc.) without the need for modification.

Converting V7 files to V8

If a consultant wants to convert a Pre-V8 formatted file, the following steps will ensure the file's integrity at the end of the process.

1. Make sure all files are clean of errors before attempting to convert from V7 to V8
2. Always work on a copy of the file when running it through EDG or a third party product.
After getting a clean file from EDG, double check its contents. Open it in MS SE and verify that it operates correctly. Check the Global Origin (GO) and working units. If it fits in a view correctly, compress it and save settings.
3. Convert file to V8 file format.
4. After the conversion, check the same criteria from Step 3. Check the GO, working units, and view fit.
5. Note: The units.def file will have to reflect any working units settings designation made for the master units and sub units.   If they are not defined in this file, MicroStation converts the units as metric by default and with no warning. We have edited the units.def file to reflect the settings being used in the City CADD environment **only**.
6. Note: All Microstation customized toolbars and palettes from pre-V8 will not work in the V8 environment. They must be recreated in V8.0 and again in V8.1.

Known Issues with V8 formatted files

The following two issues were found to occur often in the WSD environment after converting to V8. The issues, symptoms, and resolutions are listed below to help quickly identify and resolve consultant occurrences.

Coordinate and Scale Corruption in V7 formatted files edited with MicroStation V8 (Build 08.xx.xx.xx) or after converting a V7 formatted file to V8.

Issue: CADD users of MicroStation V8 (Build 08.xx.xx.xx) have reported coordinate and scale corruption in some V7 formatted DGN files edited with MicroStation V8 or with V7 formatted files that have been converted to V8 format.

Symptoms: Characteristics of this issue include the complete loss of the NAD 27/ 83 file coordinate system, incorrect reporting of Global Origin, and the incorrect scaling of design elements in a file. Problems have been reported about cell or text elements being placed at the wrong scale, or reference files that no longer appear in the correct location. Some CADD users may not experience any of the symptoms listed above, even with the issue present.

Resolution: The steps to correct this issue have not been consistent between each case and are too numerous to document in this forum.

Multi-line Text Elements Drop to Single-line Text elements after placement using MicroStation V8 (Build 08.00.04.01)

Issue: CADD users of MicroStation V8 (Build 08.00.04.01) have reported that multi-line text and note elements placed in DGN files post-upgrade are not maintaining multi-line attributes after the user exits the file. Upon re-entering the DGN file, users are discovering that any multi-line text or note elements placed during their last production session have translated into single-line text or note elements. This issue has been logged and confirmed with Bentley Systems, Incorporated, and has been identified by Bentley as a programming error that will be corrected in a future release of the product.

Symptoms: Characteristics of this issue include multi-line text or note elements that translate into single-line text or note elements between two consecutive production sessions in a DGN file. Some users have reported multi-line text or note elements that seem to 'disappear' upon placement in the DGN file, or multi-line text or note elements that are placed erroneously in the DGN file and do not appear in their expected location. Some CADD users may not experience any of the symptoms listed above, even with the issue present.

Resolution: Bentley Systems recommends the steps outlined below to correct this issue.

1. *Open* a DGN file to begin a CADD session.

2. *Go* to the **Workspace** menu and *select* **Preferences** …

3. In the corresponding Preferences dialog window, *select* **Text** from the Category column and *select* Dialog Box for the **Text Editor Style**

S&S and I/RASC Addendum to Consultant Document

The following are problems encountered with the engineering applications in relation to the V8 upgrade. These applications may be used by only a few consultants.

InRoads/Storm and Sanitary:
1. Toolbars customized from previous versions are not portable.
   Solution: Custom toolbars need to be re-created in V8.0 and again in V8.1.

2. The .ttn file type filter has been removed although .ttn files are still readable / loadable.
   Solution: Use "All Files" filter to see the .ttn in the file pick list.

3. Profile creation of segments with butt-to-butt pipe connection is not working correctly.
   Solution: None. Bentley is currently working on the fix.
   Workaround: Create the profile in reverse, from right to left, and then flip it in microstation.

4. Drainage profile annotation has the pipe IE reversed.
   Solution: Bentley fixed this in the version for V8.1.

5. InRoads or S&S won't load from within Microstation (using "mdl load").
   Solution: Registry patch to set the default app for the CurrApp key.
   Workaround: Launch InRoads or S&S from the "Start" menu outside microstation.

I/RASC:
1. V7 DGN files containing reference files will not plot.
   Solution: Convert V7 files to V8.

2. License manager does not track license requests properly.
   Solution: Use third-party software to monitor usage.